FDOT Civil 3D Plan Quantities Using FDOT Takeoff Manager

2014 Design Training Expo

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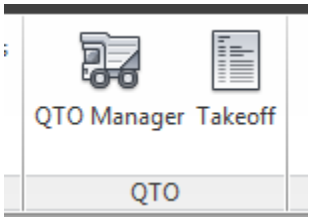
FDOT

Why a New Application?

Currently in the “Out of the Box” AutoCAD Civil 3D located on the “Analyze Ribbon” is the QTO Manager and Takeoff commands.

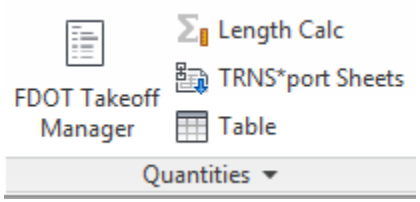


The limitations of quantifying using those methods was in how the data was delivered and formatted. Without major editing of the raw csv file to fit the table or spreadsheet you would have a lot of cats to herd to get it right.

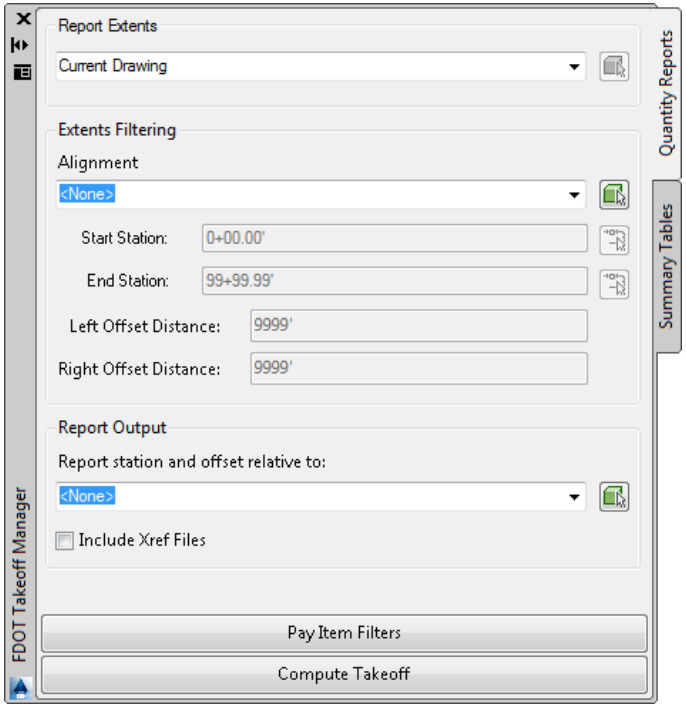
Now with that being said it is still not a perfect one click shot to perfect reports. You still have some possible cleanup to do especially on the non auto-populated and some of the Auto populated ones.

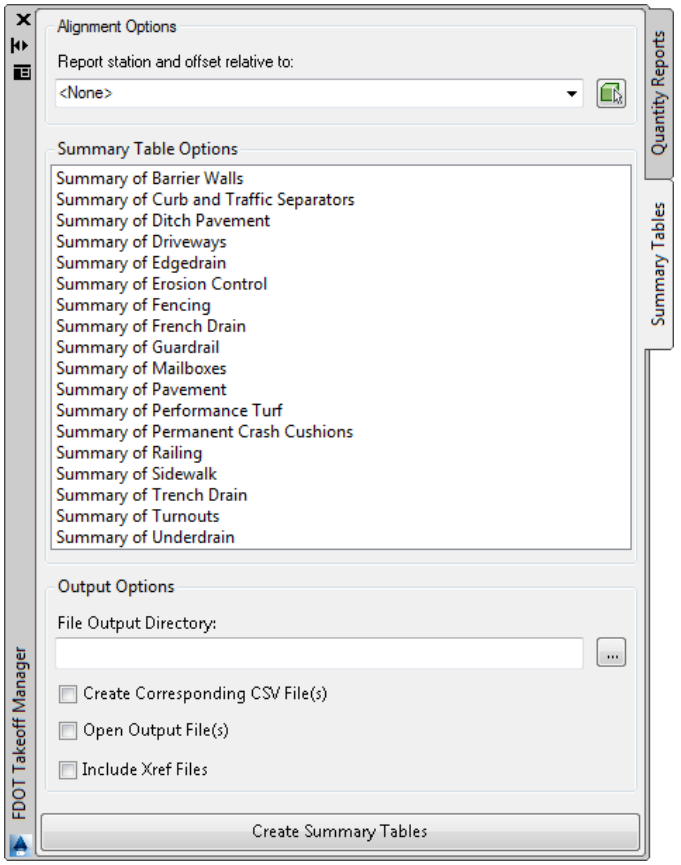
Overall for a initial release of this tool it is pretty solid. As we release future versions of this too we hope to include more Automation of the reports.

The Interface



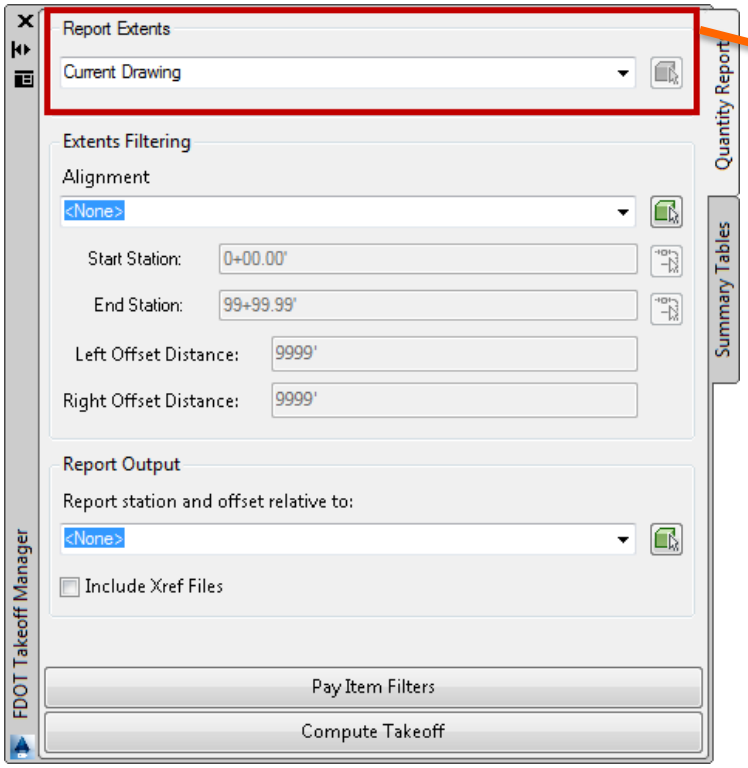
The Takeoff Manager Application Icon is located on the FDOT Ribbon in the Quantities Section. Future reference of Takeoff Manager in this document is TM

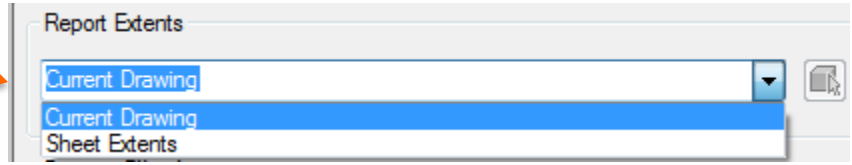




The application dialog box contains 2 tabs “Quantity Reports” and “Summary Tables” The Dialog behaves like other AutoCAD boxes. You can allow docking, Auto-hide, etc.

“Quantity Reports” Tab

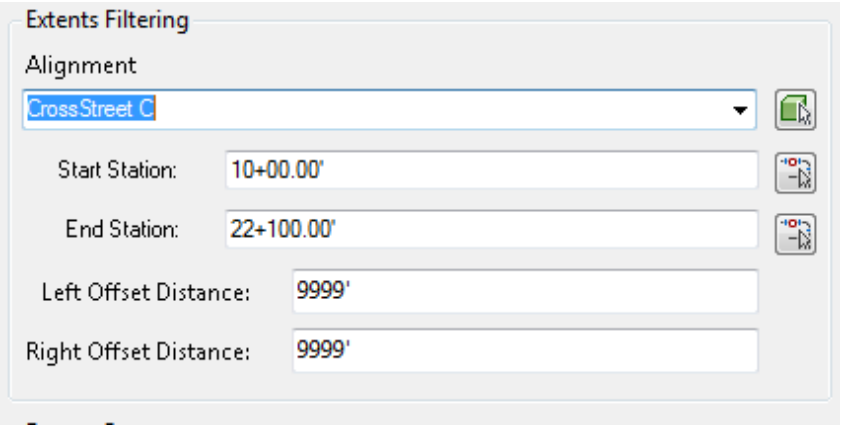




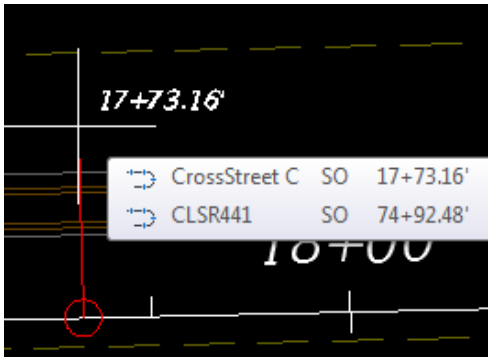
The Report Extents controls what you are reporting on. The default is the Current Open Drawing which is everything in the open drawing in Model Space.

If you select Sheet Extents TM will be grayed out and you will be directed to the AutoCAD QTO dialog box where you can get individual sheet quantities. All individual sheet quantities are calculated from match line to match line in each sheet tab. Keep in mind that you can only do one sheet at a time in this mode and you have to click in each sheet tab to make it active to run this feature. When you close the QTO dialog box full functionality returns to TM.

“Quantity Reports” Tab



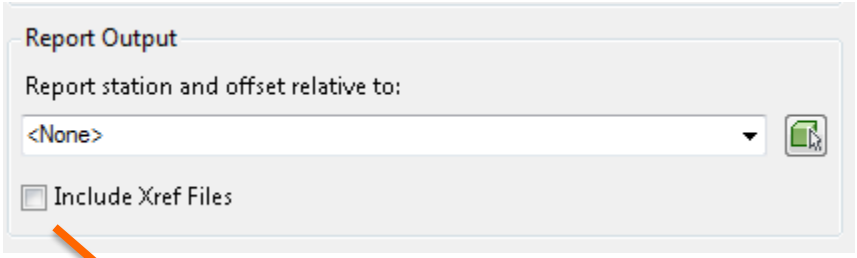
The Extents Filtering allows you to select the Alignment in the drawing that you want to report off of.
You can use the pull down and select from the list of Alignments in the file or you can pick the select from drawing icon which will close the box so you can pick it on your screen. You can also select none if you just want a quick summary of pay items.



After selecting the Alignment you can either enter a station range or select the pick from drawing icon which will activate a red jig so you can pick your stations along the selected Alignment. The default is the entire length unless you choose otherwise.

You can control the offset distance by entering a search swath width, which is important if you are reporting off of one specific Alignment among possibly many Alignments.

“Quantity Reports” Tab

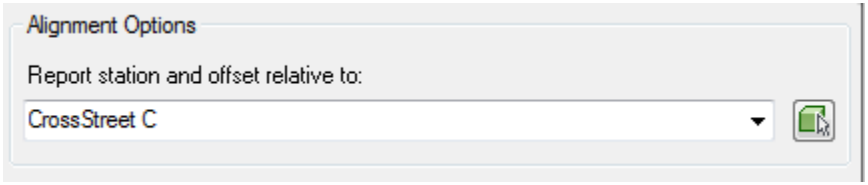


To get a report of items listed with a station offset location select the same Alignment in the “*Report Station and Offset Relative to*” pull down as you did in the *“Report Extents”* pull-down.

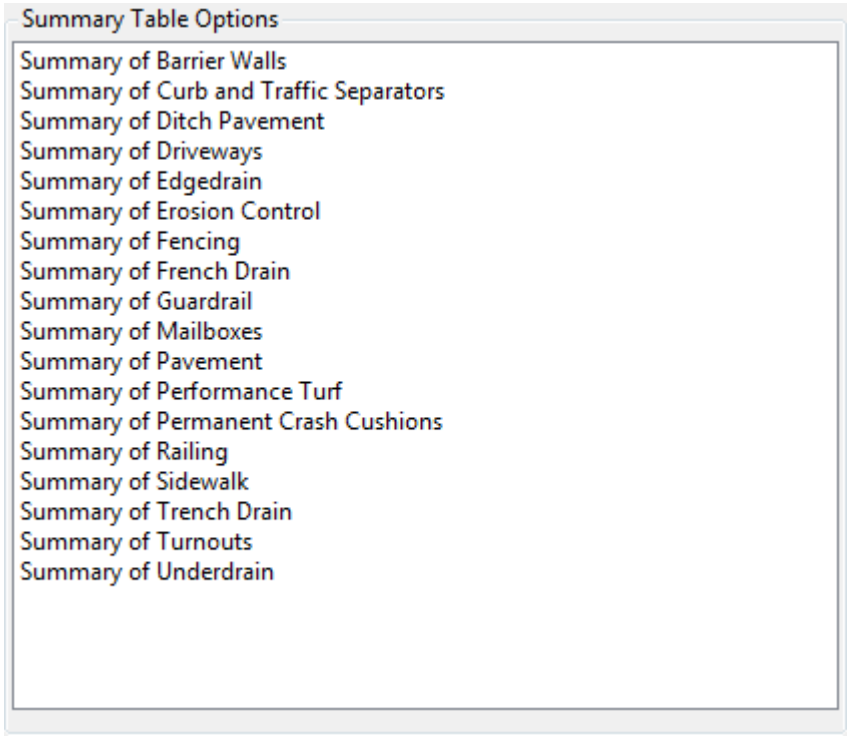
If you have a drawing open that has pay items in an attached X-ref you can select the Include Xref Files button.

A quick note on Xref quantities. This option works great, however if you are generating area quantities such as sod it is recommended that you do not use the Xref option and run quantities in the source file. What happens is the program looses the area Id in the xref and will report a different Id handle.

“Summary Tables” Tab

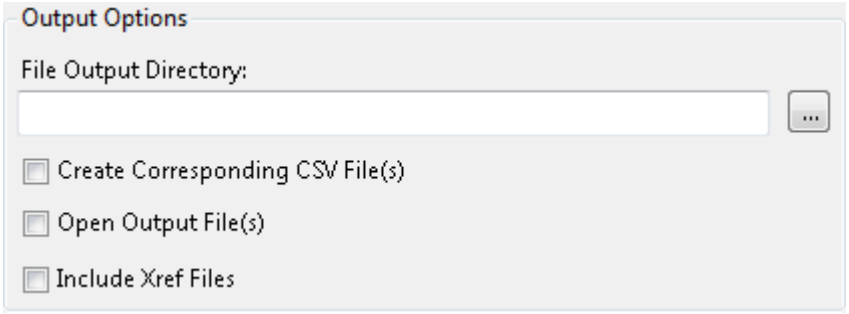


The Alignment Options behaves similar to Extents filtering on the Quantity reports tab. It allows you to select the alignment from the list or select it in the drawing.



The Summary Table Options contains a list of pre-formatted excel files that will Auto populate when selected and a report generated.

“Summary Tables” Tab



The “Output Options” section allows you to select what options you want to do with the report you just generated.

Select the Ellipses button next to the File Output Directory to browse to where you want to put your report data, it is preferred that you put it in the appropriate folder within your project folder structure

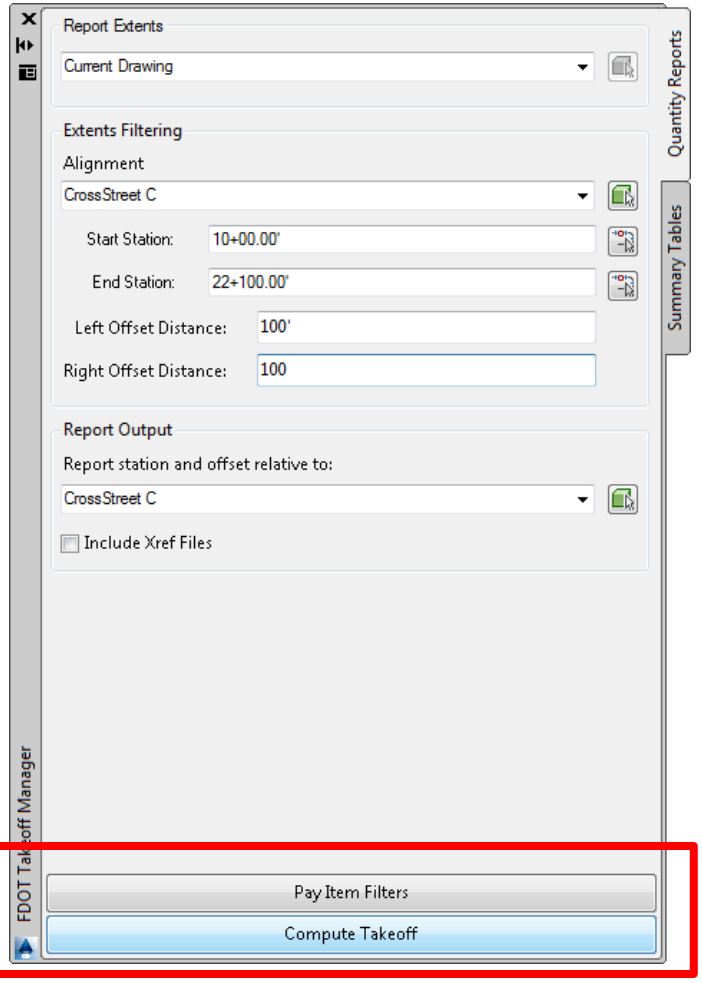
Create Corresponding CSV File –When selected it creates a CSV file in addition to the Auto populated Excel File. Both files are saved to your Output Directory location.

Open Output File - Upon completion of generating a report it will automatically open the file

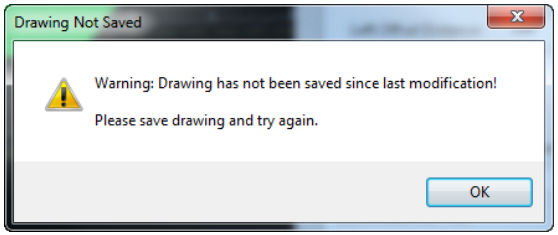
Include Xref Files - Use this option if you have an attached Xref with pay items.

"Quantity Reports" Tab

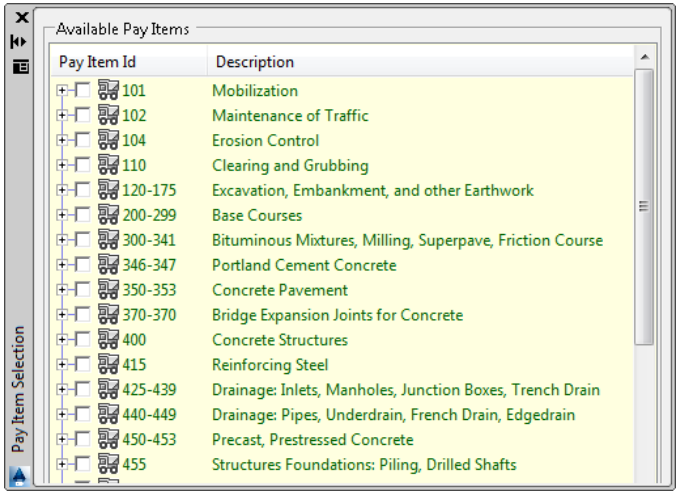
Generating a Report



When you make your selections on what you want to Quantify select Compute Takeoff

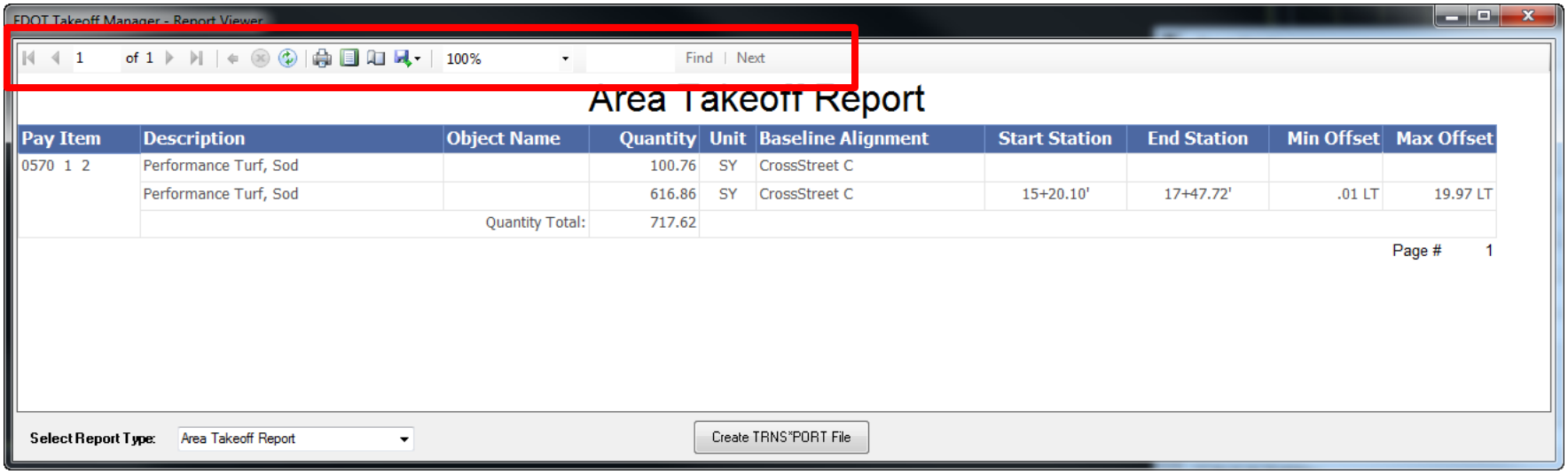


If you haven't saved your drawing a friendly reminder will pop up telling you to do so. Select OK and save your drawing then repeat picking Compute Takeoff



If you want to run a Pay Item Number specific report select the "Pay Item Filters" button and a available Pay Items list dialog box will appear so you can select the item you want to report on only. The default is everything in the drawing will be reported on.

"The Report Interface"



Before we take a look at the actual report lets look at the anatomy of the report itself

Search Report for Keywords

Scroll Navigational buttons for Multi page reports

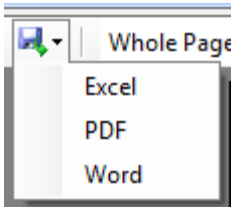
Refresh Report

Print Report

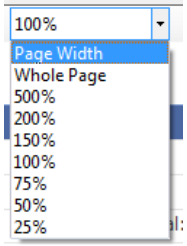
Print Preview

Page Setup

Save As Mode



Quick Zoom Feature



HINT- If you seem to be stuck in Layout or Preview mode click the same Icon again to exit that mode.

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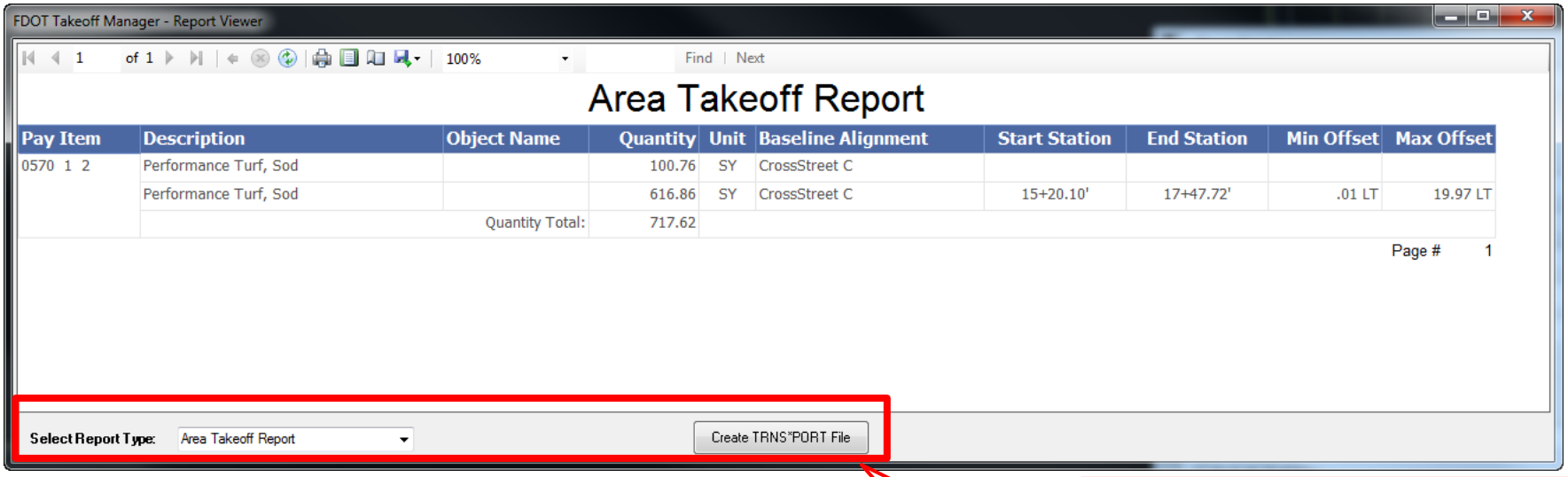
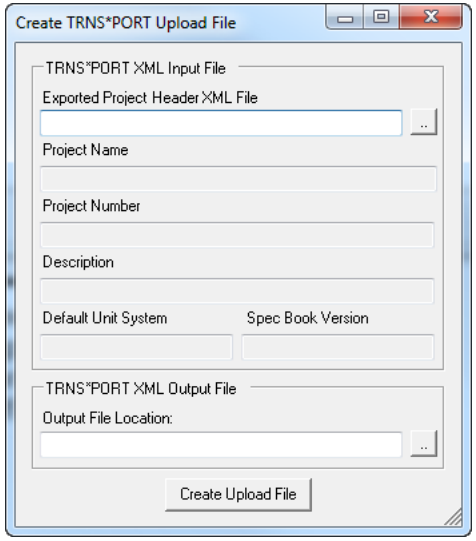
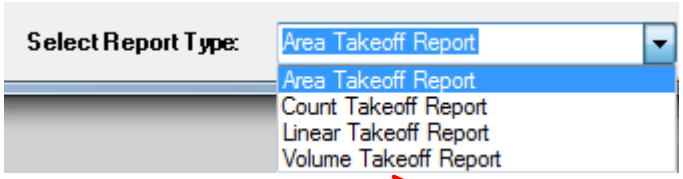
"The Report Interface"



TRANS*PORT Interface to Generate Reports





If you run a report and it comes up blank It may be due to the incorrect Report Type selected.

There are four Report Types to Choose from. Area, Count, Linear, & Volume. Each Pay Item has a formula attached that determines which Category it falls into.

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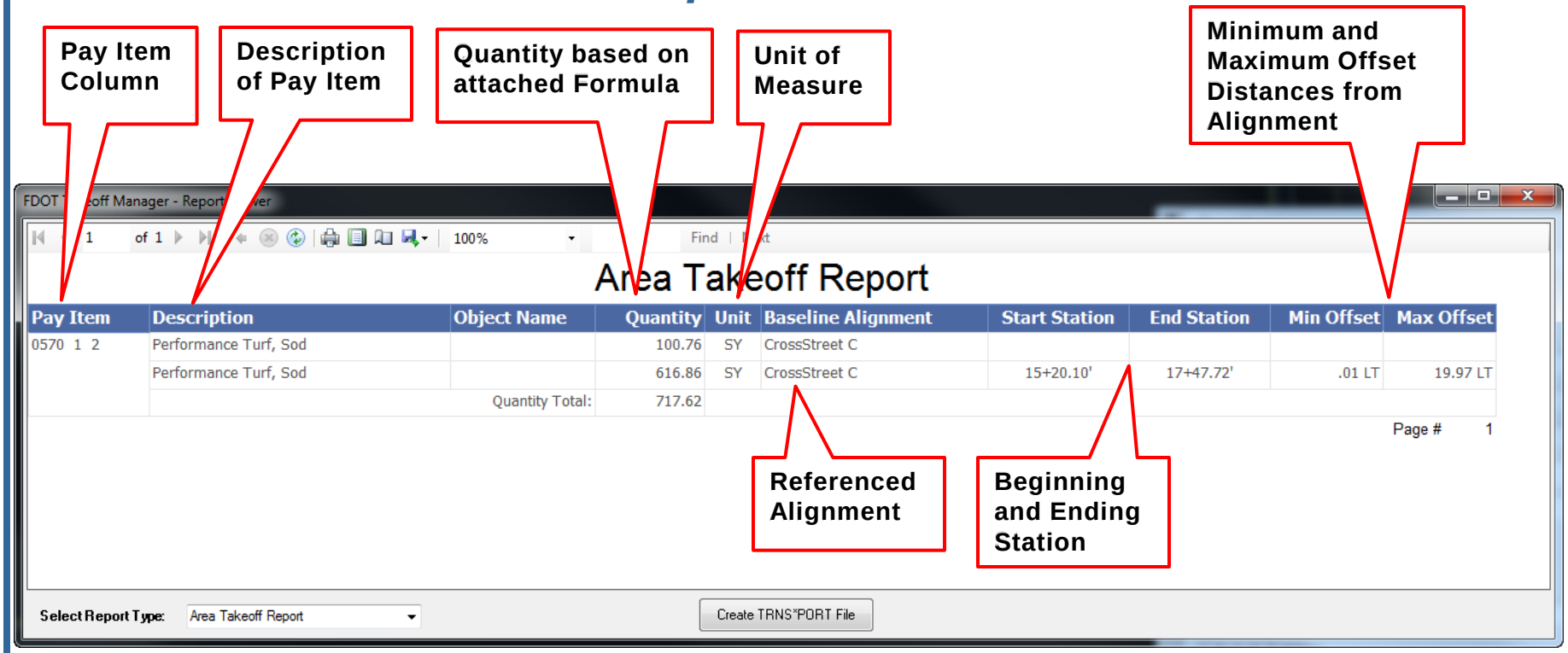
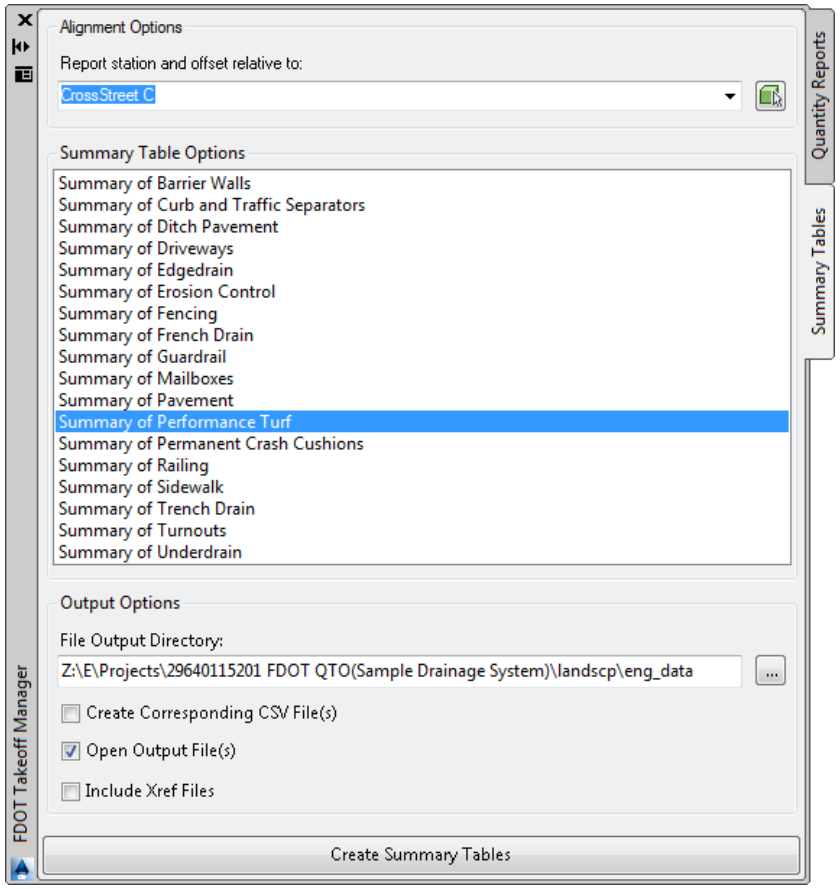
"The Report Interface"



In this example we have a Area report showing performance Turf, Sod using the "Quantity Reports" tab.

From here we can save it to a Excel, Word, or a PDF file for further editing.

“Summary Table Report”



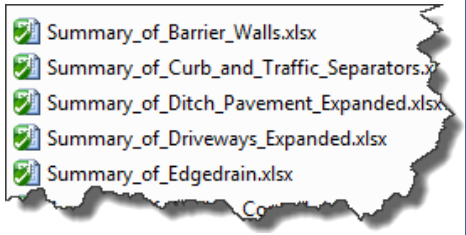
Let’s run the same report, but with the Automated Summary Tables. Do the following.

- Select an Alignment
- Select the desired Summary Table
- Designate the Output Directory for the file
- Select open Output File
- Click on the Create Summary Tables button

Let’s look at what is happening behind the curtain.

FDOT2014.C3D ▸ Data ▸ Templates ▸ XLSX ▸ Summary Reports

In your install directory there is a new folder that contains all of the XLS files and corresponding XML files.



When you run the “Create Summary Tables” button the application finds the corresponding XML file to see what pay item numbers match, then it puts them into the correct column in the target Excel file.

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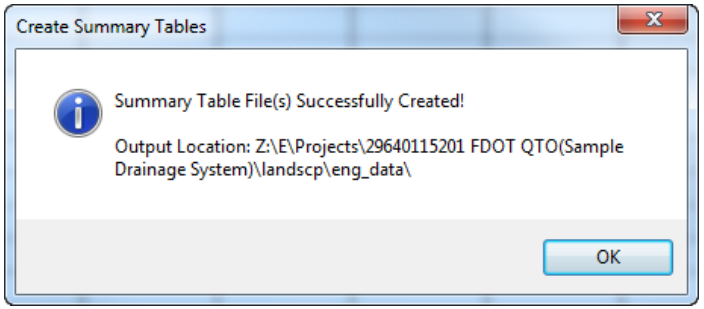
“Automated Report”



Another friendly reminder tells you that the report creation was successful and then it opens in Excel

This is a truncated report, but you get the idea.

SUMMARY OF PERFORMANCE TURF															
LOCATION			SIDE	AREA ID	LENGTH	WIDTH	PERFORMANCE TURF		PERFORMANCE TURF (SOD)		PREPARED SOIL LAYER		DESIGN NOTES	CONSTRUCTION REMARKS
							0570 1 1		0570 1 2		0162 1 11			
STA. TO STA.							SY		SY		SY			
							P	F	P	F	P	F		
	to		RT	48A3					100.8					
15+20.10'	to	17+47.72'	LT/RT	4A5F					616.9					
						SUB-TOTAL:			718					
						TOTAL:			718					

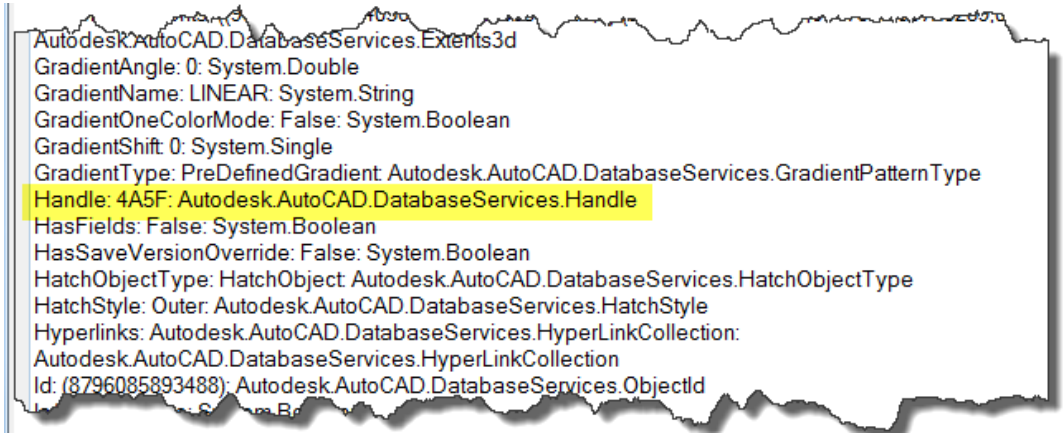
“Automated Report”

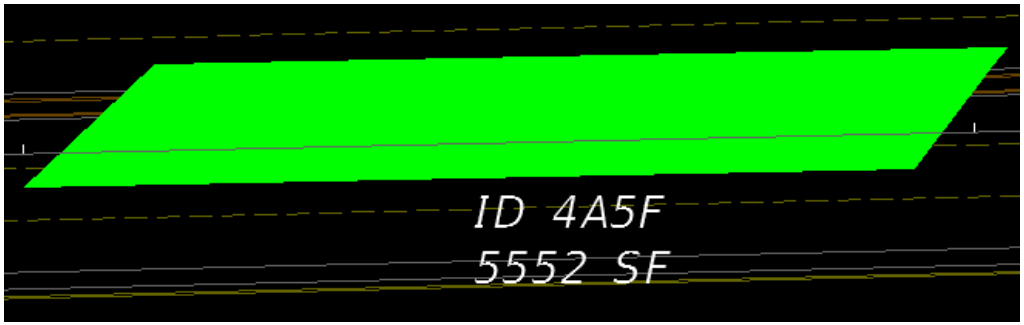
AREA ID	LEN
48A3	
4A5F	

What’s with that Area ID Info on my Report??

EVERY object that is drawn in AutoCAD has a unique handle assigned to it that never changes as long as that object isn’t deleted and re drawn.

HINT- To see a list of these neat things type in “SUPERLIST” on the command line. This feature is in MR1 release of our state kit.





Entity manager has a NEW Label icon that will label all hatched areas with its own unique handle. You can use this so you can identify the shapes in the drawing that show up on the report.

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"Automated Report"

Bringing it into AutoCAD Option One

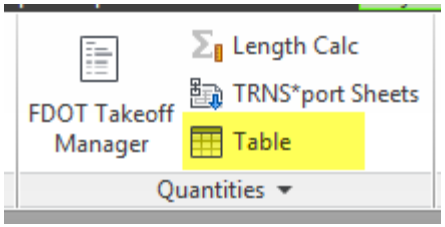
Lets go over the options to bring in the "Summary of Fencing" Report. There are two different options to bring it in.

- Option One- Link direct from Excel
- Option Two- Link the Excel Cells to a Pre-formatted AutoCAD Table

SUMMARY OF FENCING

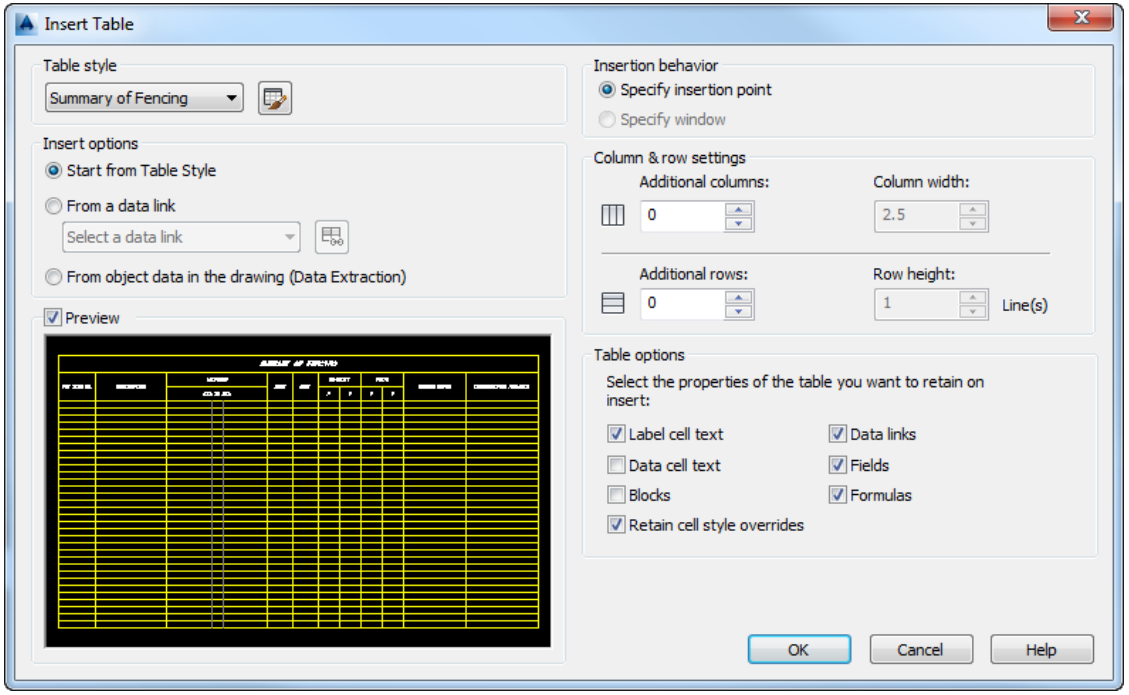
PAY ITEM NO.	DESCRIPTION	LOCATION STA. TO STA.			SIDE	UNIT	QUANTITY
0550 10150	Fencing, Type A, 8.1- 10.0' Height, Standard	10+23.53'	to	17+50.25'	RT	LF	726.8
		20+09.66'	to	20+09.66'	LT		782.8

Let's do Option One first. Above you can see the Auto-populated Fencing summary as it appears in Excel. On the FDOT ribbon pick the Table Icon.

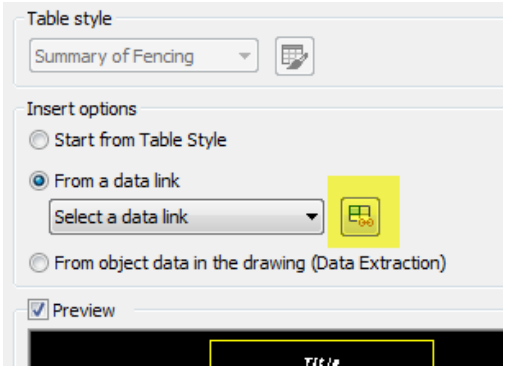


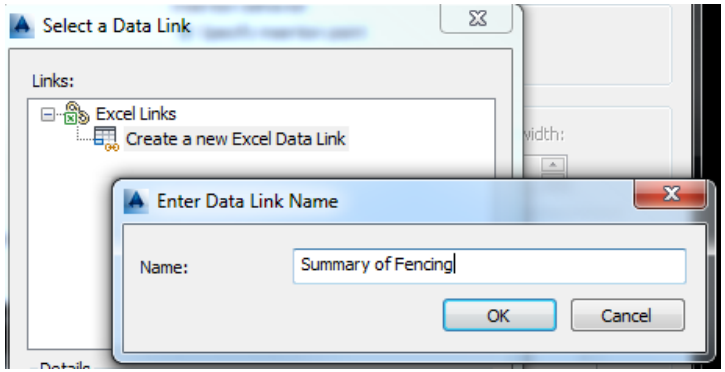
“Automated Report”

Bringing it into AutoCAD Option One



The Insert Table Dialog box opens. Since we want to do Option one select the “From a Data Link” and select the Data Link Manager icon that is highlighted below.





We want to create a new Data link so select “Create a new Excel Data Link” and name it appropriately.

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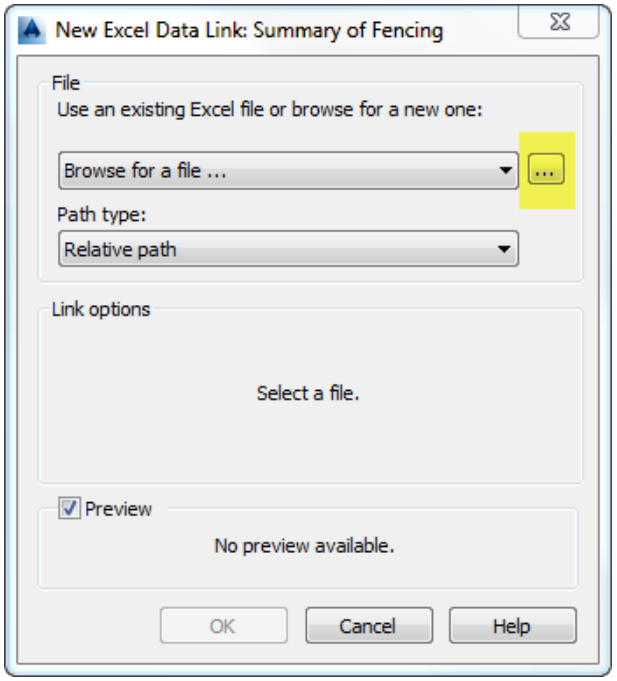
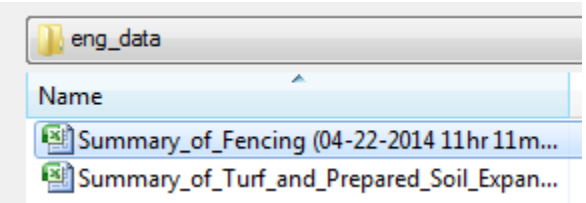
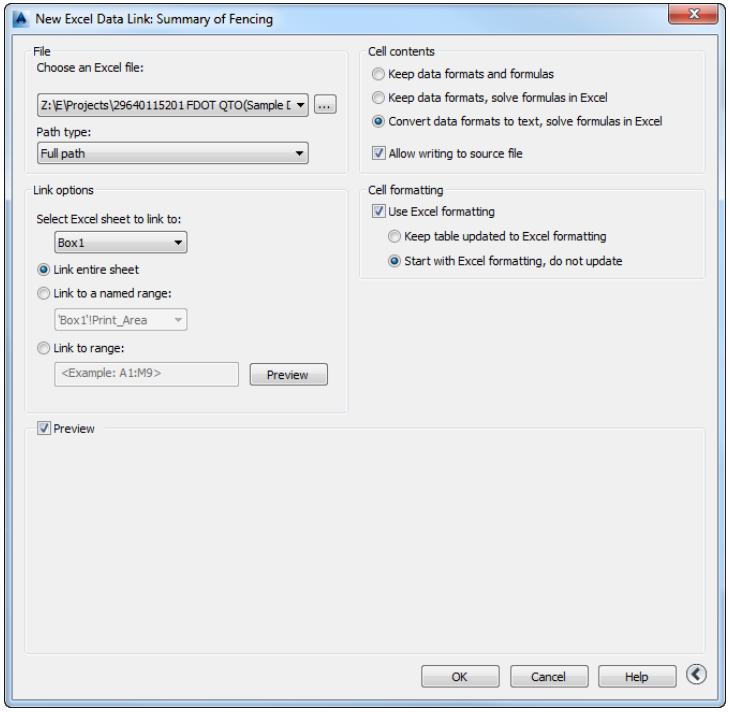
“Automated Report”

Bringing it into AutoCAD Option One



Select the “Browse for a File” Ellipses button. Browse to the appropriate eng_data folder within your project where you saved the initial Report





As you can see the dialog box fills in with the info you have selected. At this point select OK.

“Automated Report”

Bringing it into AutoCAD Option One

SUMMARY OF FENCING								
LOCATION			SIDE	UNIT	QUANTITY		TOTAL	
STA. TO STA.					P	F	P	F
10+23.53'	to	17+50.25'	RT	LF	726.8		1510	

Upon first glance it needs a little adjustment to look correct.

Select the entire table. Be careful to select the border instead of inside a cell. Click in the Arrowhead Grip and move it in to fit inside your sheet border.

	C	D	E	F	G	H	I
SUMMARY OF FENCING							
LOCATION				SIDE	UNIT	QUANTITY	
STA. TO STA.						P	F
	10+23.53'	to	17+50.25'	RT	LF	726.8	
	20+09.66'	to	20+09.66'	LT		782.8	

To fix the above image select inside of the cell to highlight it. Using the top or bottom square grip expand the cell so the text will shift to its correct placement.

	C	D	E	F	G	H	I	J	K
SUMMARY OF FENCING									
LOCATION				SIDE	UNIT	QUANTITY		TOTAL	
STA. TO STA.						P	F	P	F
	10+23.53'	to	17+50.25'	RT	LF	726.8		1510	
	20+09.66'	to	20+09.66'	LT		782.8			

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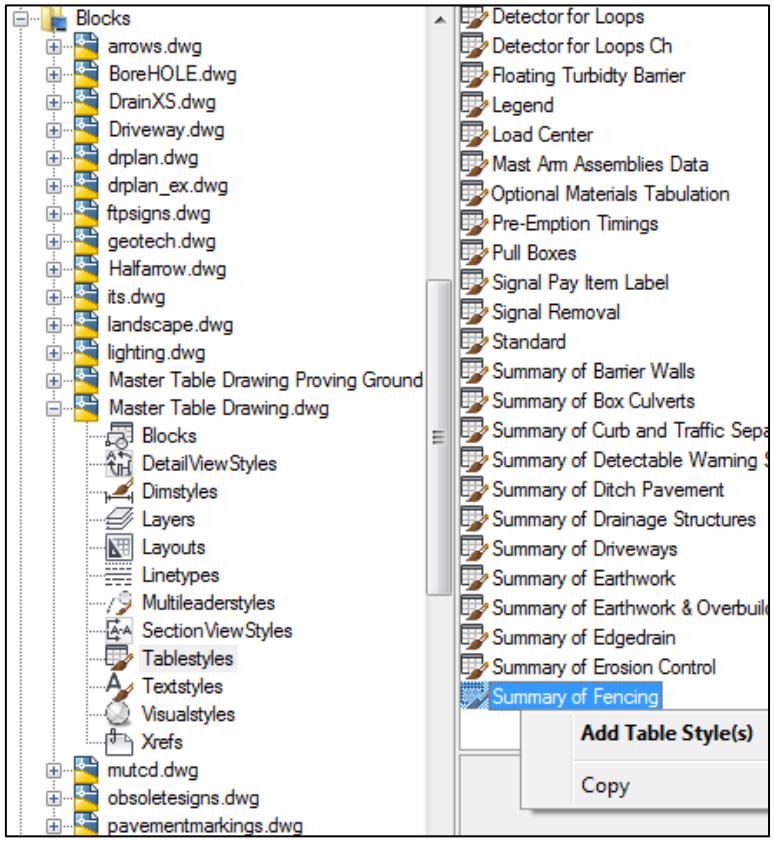
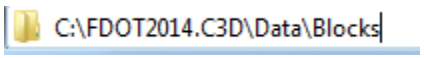
"Automated Report"

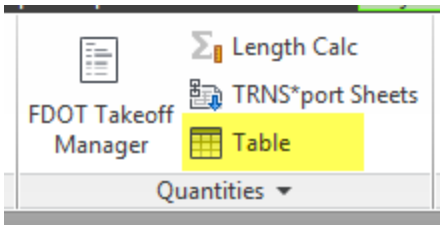
Bringing it into AutoCAD Option Two



To begin with lets make sure you have the proper Table in your Drawing. Type "DC" on the command line to launch "Design Center" Within Design Center browse to the Blocks folder in the State Kit install Directory



Expand the "Master Table Drawing" and select Tablestyles. Right click on the desired table name and select "Add Table Style"



Now you are ready. Select the "Table" Icon again.

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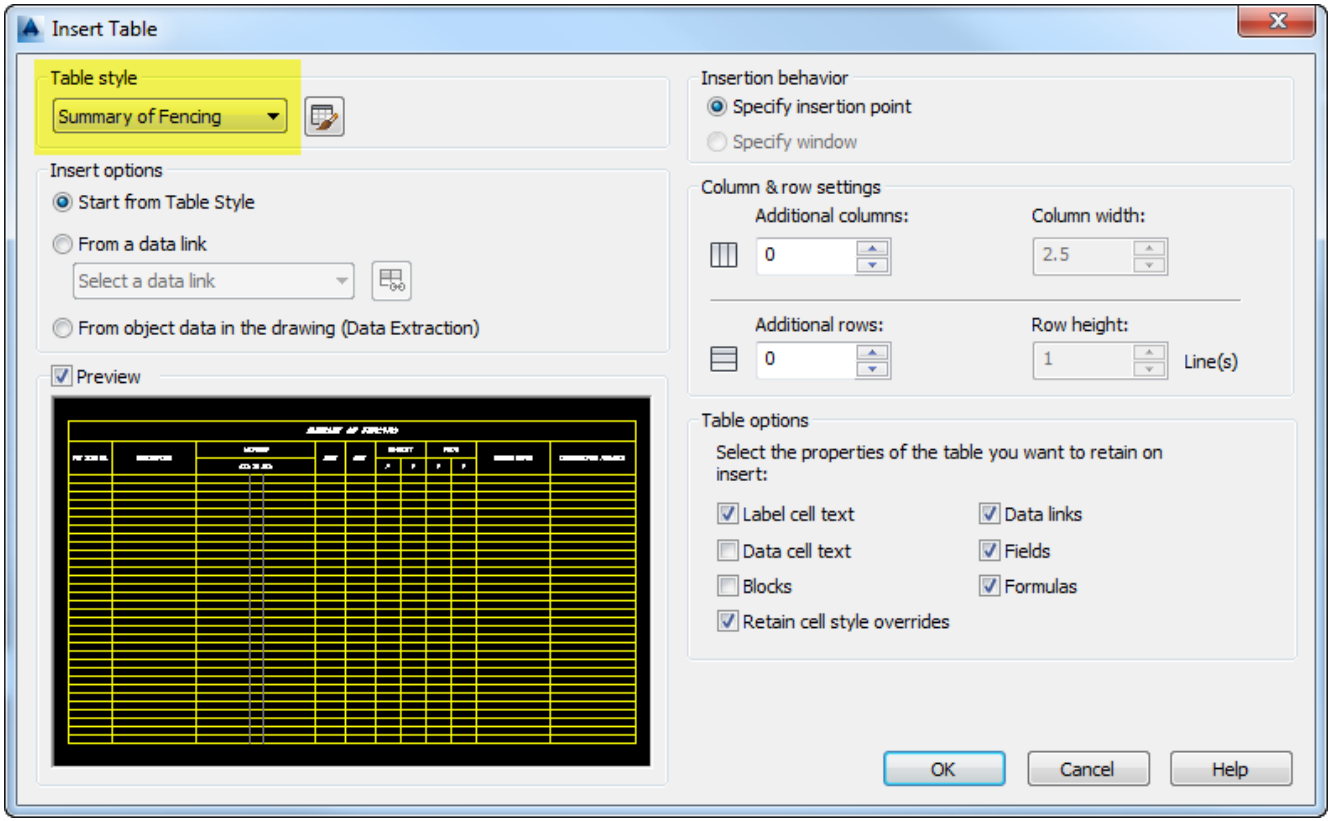
“Automated Report”

Bringing it into AutoCAD Option Two



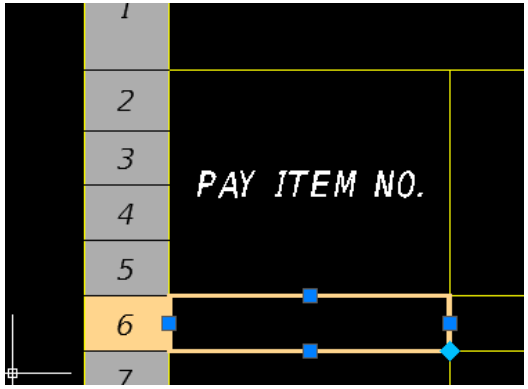
This time when the “Insert Table” dialog box comes up select the “Table Style” pull down to select the desired table in this case “Summary of Fencing”.

Make sure you match the selections in the lower right corner in the Table Options section.

Select “OK”

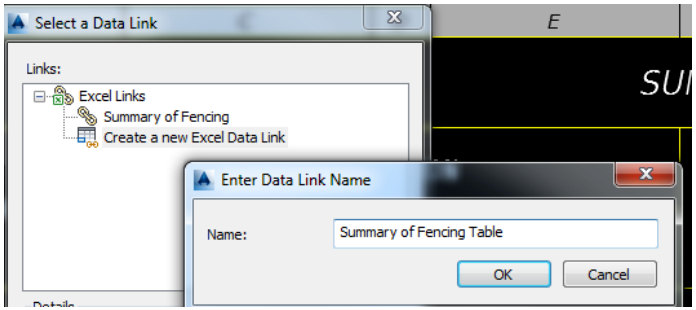
“Automated Report”

Bringing it into AutoCAD Option Two

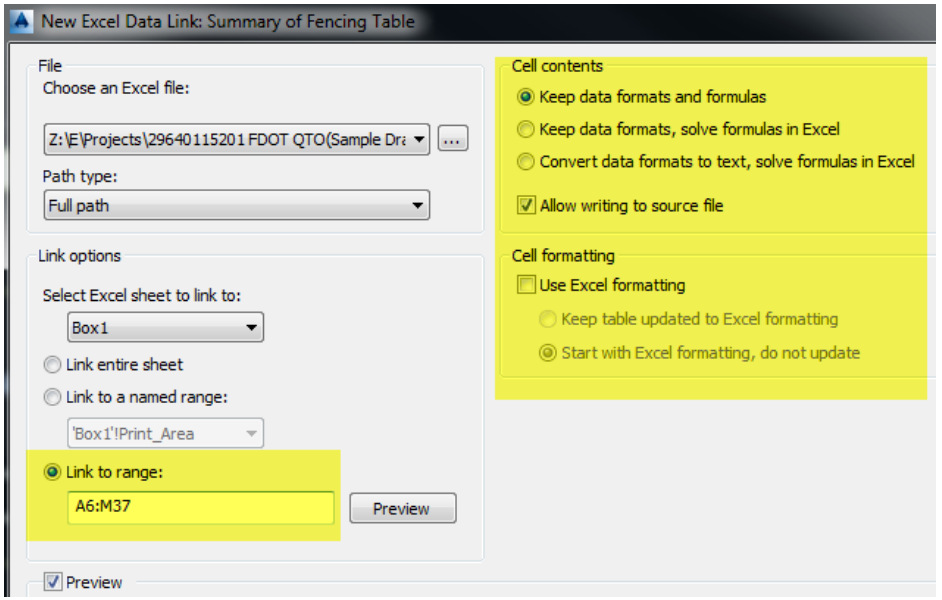


With Table now inserted select the first cell where data will go.

The Table Contextual ribbon appears. Select “Link Cell”



Create a new Excel Data Link. Browse to the report location as before then Select the “Link To Range” It is important to pick the exact Range in the Excel file so it will match the Table.



Don’t pick the column headers, just where the data begins (Ex. From above A6)

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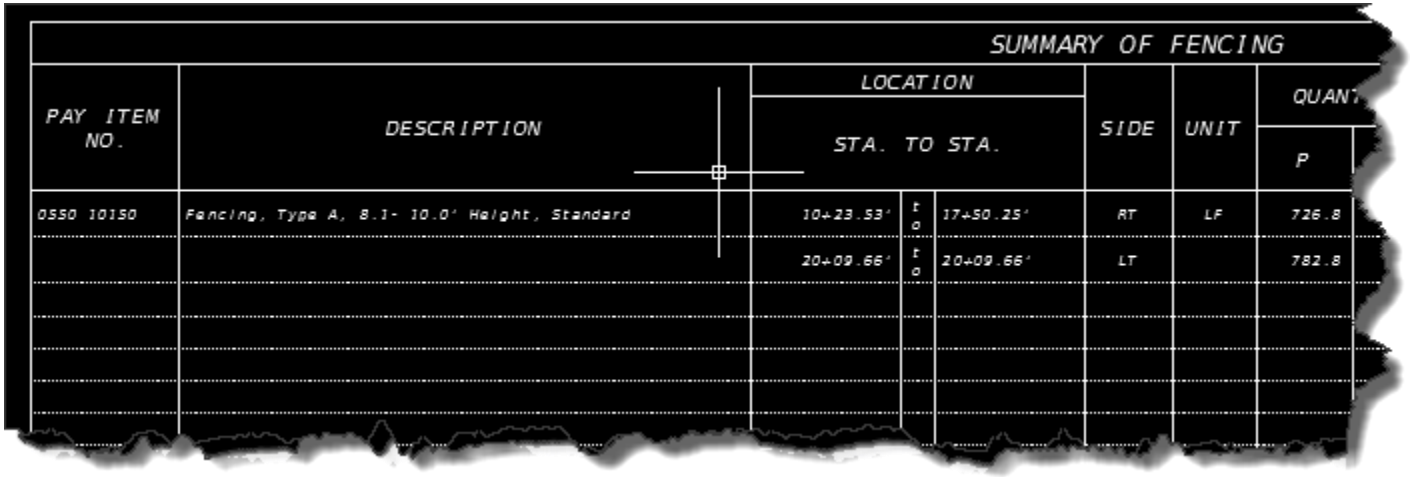
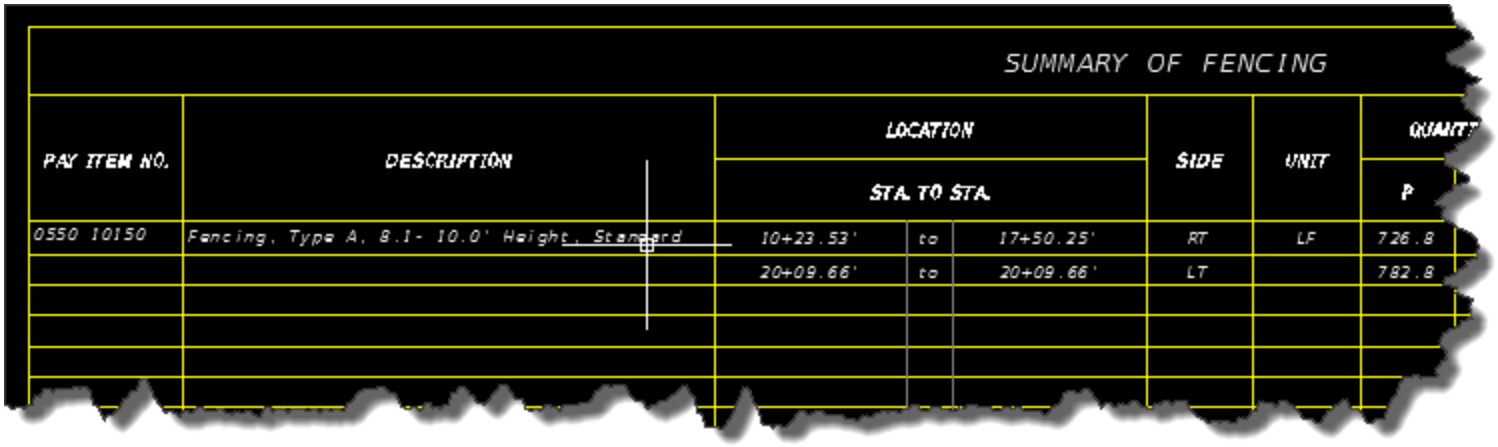
“Automated Report”



SUMMARY OF FENCING

PAY ITEM NO.	DESCRIPTION	LOCATION STA. TO STA.			SIDE	UNIT	QUANT P
0550 10150	Fencing, Type A, 8.1- 10.0' Height, Standard	10+23.53'	to	17+50.25'	RT	LF	726.8
		20+09.66'	to	20+09.66'	LT		782.8



SUMMARY OF FENCING

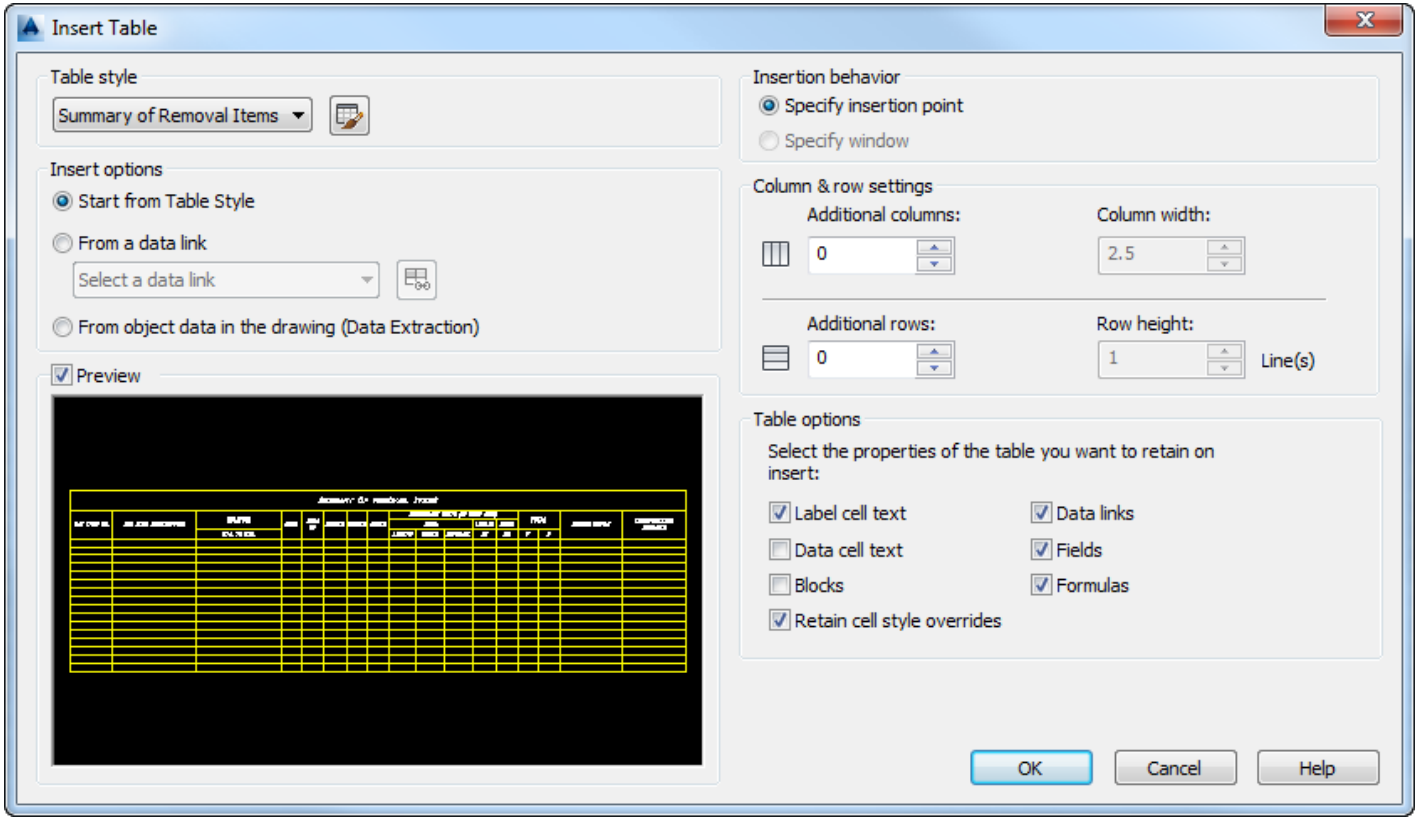
PAY ITEM NO.	DESCRIPTION	LOCATION STA. TO STA.			SIDE	UNIT	QUANT P
0550 10150	Fencing, Type A, 8.1- 10.0' Height, Standard	10+23.53'	to	17+50.25'	RT	LF	726.8
		20+09.66'	to	20+09.66'	LT		782.8

As you can see the visual differences are minimal between the two options. You can still edit the cells in both as far as size goes. Depending on the table you use you can also break the link in the AutoCAD Table option and manually enter data and formulas if you need a quick edit.

“Part Two”

“Miscellaneous Edits”

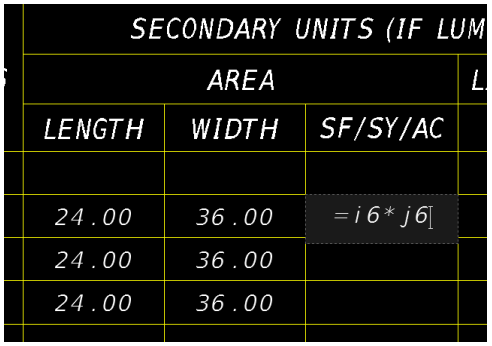
“Editing a Table”



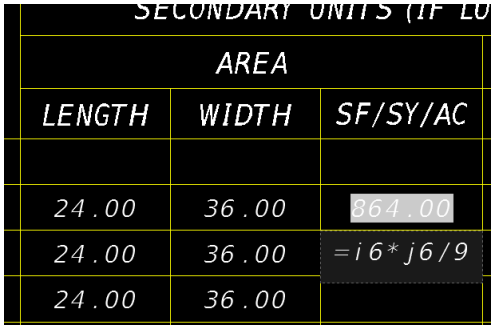
Click on the “Table” Icon and insert the “Summary of Removal Items” make sure you are in Paper Space in your current Tab.

“Editing a Table”

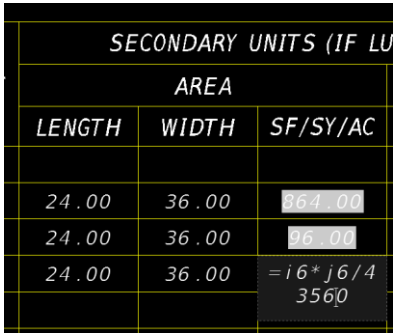
Adding a Formula



You can type a formula in a cell like Excel. In this example we are adding a Square Footage formula.



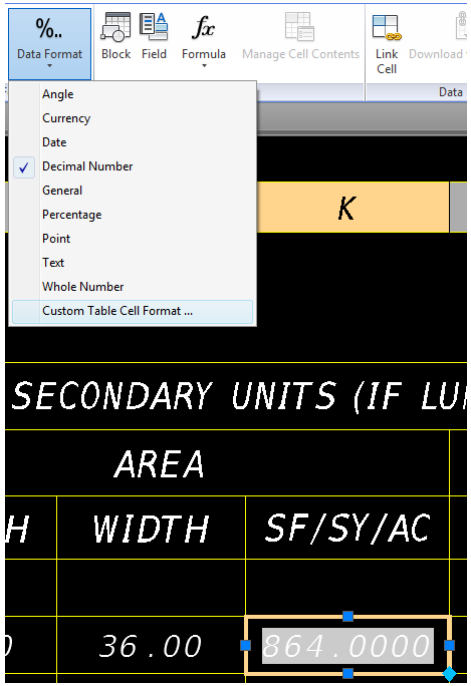
In this example we are typing a Square Yardage formula.

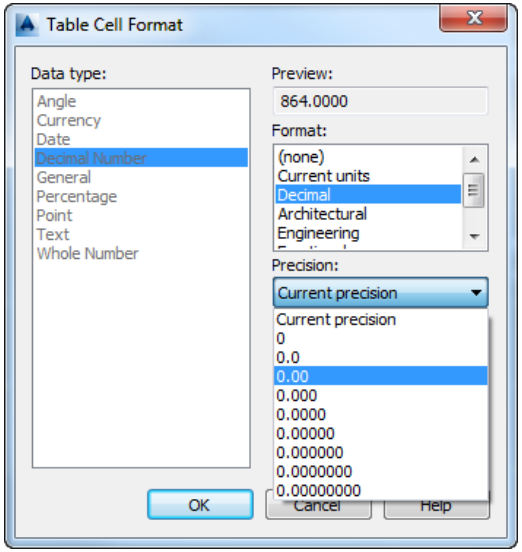


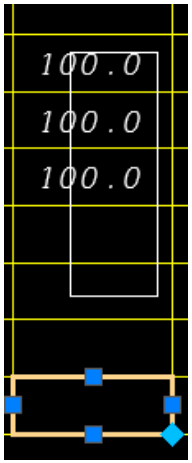
In this example we are typing a Acreage formula.

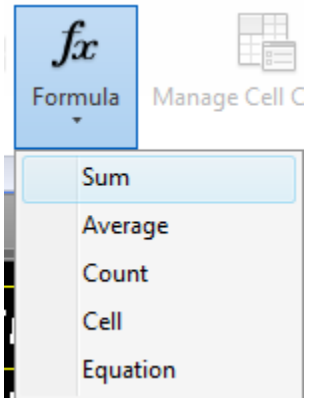
“Editing a Table”

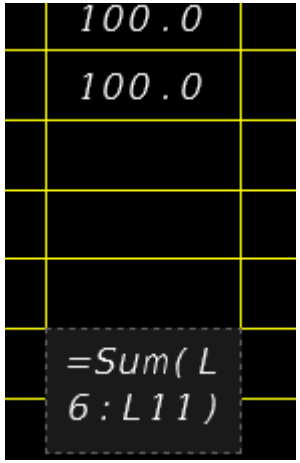
You can change the precision by selecting the “Data Format” > “Decimal Number” > “Custom Table Cell Format”











To add a “SUM” Equation to your table select the Target Cell. On the ribbon select SUM on the Formula Pull-down. Left click your mouse in the top of your cell range it will go into a window feature and then left click on the bottom of your cell range. You should see the formula populate your target cell at this point. Press Enter to complete the process

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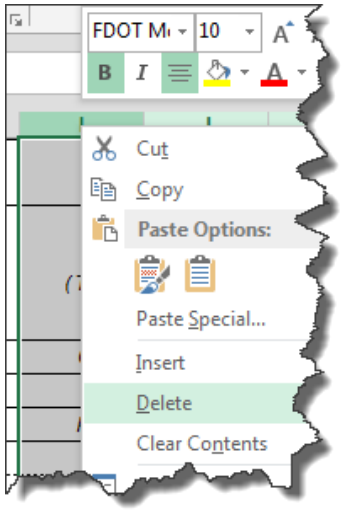
“Editing a Excel File”

The below example is of the Summary of Guardrail report. It contains numerous columns that will not fit in a typical FDOT 11x17 sheet. The reason is due to each column containing every Pay Item scenario using guardrail. After running the report you will need to delete the unused columns.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1															
2	LOCATION			SIDE	GUARDRAIL (W-BEAM)		GUARDRAIL (W-BEAM DOUBLE FACE)		GUARDRAIL (THRIE BEAM)		GUARDRAIL (THRIE BEAM DOUBLE FACE)		GUARDRAIL (MODIFIED THRIE BEAM)		GUAR (INSTALL
3					0536 1 1		0536 1 3		0536 1 5		0536 1 9		0536 1 11		0536
4	STA. TO STA.				LF		LF		LF		LF		LF		
5					P	F	P	F	P	F	P	F	P	F	P
6	10+62.37'	to	16+60.80'	LT	598.4										
7	10+79.00'	to	16+30.37'	RT	551.4										
8															
9															
10															
11															
12															
13															
14															



Select the columns in Excel >Right Click and select Delete. You will need to do these steps on several of the tables in Excel before you bring them into your drawing.

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